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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/783,958

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Robert S. Whitehouse

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EXAMINER

HAIDER, SAIRA BANO

ART UNIT

PAPER NUMBER

1796

MAIL DATE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/783,958	<b>Applicant(s)</b> WHITEHOUSE, ROBERT S.	
	<b>Examiner</b> SAIRA HAIDER	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02/10/2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 81-122 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 81-122 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/16/2009 &amp; 02/03/2010</u> .                             | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

#### ***Claim Rejections - 35 USC § 103***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 81-87, 99-110, 119 and 122 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noda et al. (US 2002/0143136) as evidenced by Satio et al. (Polymer International).

4. Noda discloses laminates having a first layer comprising a PHA (polyhydroxyalkanoate) copolymer and a second layer comprising a PLA polymer, wherein articles comprises the laminate are also disclosed (abstract). Wherein the second layer reads on the claimed substrate with a surface. Noda discloses that the PHA copolymer comprises at least two randomly repeating monomer units (RRMUs), wherein the first RRMU is prepared from a comonomer represented by formula (I), specifically 3-hydroxybutyrate ([0017-0019]). The second RRMU is prepared from a comonomer represented by formula (III) which reads on 4-hydroxybutyrate when m is preferably 3 ([0020-0022]).

5. Noda notes that the films comprising the PHA copolymer can be thermally bondable (i.e. possess adhesive properties), specifically noting that laminates comprising a PHA copolymer layer and a PLA polymer can improve the bonding characteristics of the films ([0062]).

6. In reference to the claimed glass transition temperature of from about -30°C to about -5°C, Noda discloses that the molar ratio of the first RRMU to the second RRMU is in the range of from about 50:50 to about 98:2. The Satio reference discloses that 3HB-co-4HB having a mole ratio of 16% of 4HB has a glass transition temperature of -7°C (Table 5). Thus it is clear that the PHA

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copolymers falling within the molar ratio of Noda would possess the claimed glass transition temperature.

7. It is noted that Noda fails to disclose with sufficient specificity so as to anticipate the claimed copolymer of 3HB-co-4HB with the claimed glass transition temperature. However, Noda's discloses a clear preference for 3HB as the first RRMU in the copolymer and 4HB as the second RRMU in the copolymer. Further Noda disclose as suitable molar ratio of the 2 comonomers which, as evidenced by Satio, possess the claimed glass transition temperature. In view of such disclosures it would have been obvious to one of ordinary skill in the art to obtain a copolymer as claimed which would have the presently claimed glass transition temperature.

8. In reference to the claimed thickness, Noda discloses that the PHA film has a thickness in the range of 0.254mm (254 microns) to 0.005mm (5 microns) ([0054]).

9. Noda discloses that the laminate is defined at two or more films joined together, such as a first layer comprising the PHA copolymer, the second layer comprising a PHA/PLA blend, and a third layer comprising PLA ([0054]). Wherein the third layer in this laminate reads on the claimed second substrate of claim 84. In reference to claims 86 and 87, Noda notes that the PHA layer can comprise a second PHA ([0030]).

10. In reference to claims 99-104, Noda discloses the inclusion of various additives in quantities of from about 0.1% to about 20% of the composition, suitable examples include colorants ([0049]).

11. In reference to claims 85 and 199, which claim a glass transition temperature of about -10°C, it is noted that the term "about" permits some tolerance and Saito reference discloses that the PHA copolymer has a Tg of -7°C. Wherein it is the examiner's position that one skilled in the art would have expected the composition of the Saito reference to have the same properties as the claimed composition. Additionally, a difference of 1-3°C in the glass transition temperature is not expected

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to change the properties of the composition. It has been held that a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

12. In reference to claims 105-110 regarding the open time and surface tack time of the adhesive composition, it is noted that since the combination of prior art references teach the identical chemical structures, the properties applicant discloses and/or claims are necessarily present. "Products of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, since the prior art teaches the identical chemical structures, the properties applicant discloses and/or claims are necessarily present. *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). The burden shifts to the applicant to show an unobvious difference.

13. In reference to claims 119 and 122, Noda discloses that both cast film and blown film processes can be used to produce either monolayer or multilayer film structures. For the production of monolayer films from a single thermoplastic material or blend of thermoplastic components only a single extruder and single manifold die are required ([0067]). Thus meeting the claimed limitations regarding pressing the PHA and separating the pressing surfaces to expose a pressed PHA (claims 119 and 122).

14. Claims 88-98, 111-118, 120, and 121 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noda et al. (US 2002/0143136) as evidenced by Satio et al. (Polymer International), in further view of Noda et al. (US 6,174,990).

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15. In reference to claims 120 and 121, Noda as evidenced by Satio applies as discussed above, wherein Noda '136 recognizes that blow film processes can be utilized to form monolayer PHA films, but fails to disclose the claimed pressing conditions: the pressure and temperature. Thus attention is directed to the '990 Noda reference, which discloses formation of molded articles using PHA. Specifically, Noda discloses blow molding an article by extruding the PHA composition into a closed hollow mold, expanding the mold, cooling to harden the plastic and then opening the mold to remove the article (col. 20, lines 31-37). Suitable pressures to expand the mold include 25-100 psi (col. 20, lines 38-41). Wherein the PHA copolymer of Saito (the 3HB-co-4HB) has a melting temperature of 130°C (Table 5). So during the blow molding process a temperature of at least 130°C is required, thus meeting the claimed limitation of a temperature of at most 150°C.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the blow molding processing conditions of Noda '990 to form the monolayer PHA film of the primary Noda reference. The motivation is provided by the fact that Noda '990 recognizes suitable blow molding processing conditions for the formation of PHA based films.

16. In reference to claims 88-98 and 111-118, Noda as evidenced by Satio applies as discussed above, wherein Noda '136 recognizes viscosity modifiers can be included in the PHA copolymer film/laminate composition ([0049]), but fails to disclose the claimed solvent, the amounts of solvent, and the claimed solvent evaporation method. Thus attention is directed to the '990 Noda reference, which discloses formation of molded articles using PHA. Noda '990 teaches the application of the PHA composition as a liquid, preferably of a low viscosity. Noda '990 notes that the PHA composition may be applied as solutions, in water or an organic solvent. Wherein the solvent must be removed after application for the adhesive to attain the required solid form; often

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heating is required to expedite the drying process (thus evaporating the solvent). Noda '990 notes that this method is advantageous because upon cooling the material hardens which lends to physical integrity of the bond; suitable substrates include paper and wood (col. 23, line 54 to col. 24, lines 39). Wherein it would have been obvious to one of ordinary skill in the art at the time of the invention to include a solvent (viscosity modifier) in the PHA copolymer composition of Noda '136 in order to form an adhesive bond to paper or wood as taught by Noda '990, which is, physically strengthened due to the cooling involved in the solvent evaporation method.

17. In reference to claims 88-93, 95, and 97, which are drawn to the amounts of solvent included in the adhesive, Noda '990 states that suitable solid contents of the solutions include from 5% to 95% (col. 24, line 28-30). Accordingly, the suitable solvent content can be calculated to be from 95% to 5%.

18. In reference to claim 96, Noda '990 discloses that the adhesive is formed by dissolving PHA in a suitable solvent (col. 23, lines 63-67). Wherein Noda '990 exemplifies that suitable solvents for dissolving PHAs include chloroform (col. 9, lines 24-26).

19. In reference to claim 114, Noda '990 notes that the heating is conducted by passing the adhesive through the glass transition temperature of one of the components (col. 24, lines 22-26), given that the PHA of Saito has a Tg of -7°C (as noted above), the temperature required for cooling is within the claimed range of at most 40°C.

20. Wherein it would have been obvious to employ the specific processes described by Noda '990 in the invention of Noda '136 including the solvent amounts, type and temperature of heating, in order to form an adhesive bondable to paper or wood, as taught by Noda '990 in order to form an adhesive bond to paper or wood which is physically strengthened due to the cooling involved in the solvent evaporation method.

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21. In reference to claim 94, which discloses that the solvent content is at most about 1% by weight, it is noted that the solvent content is recognized as a result effective variable because changing them will clearly affect the type of product obtained. See MPEP § 2144.05 (B). Case law holds that “discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art.” See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In view of this, it would have been obvious to one of ordinary skill in the art to utilize a less than 5% solvent in the adhesive, in particular less than 1% so as to produce desired end results. Wherein utilization of less solvent results in a decreased heating time to remove the solvent and an increase in the thickness of the adhesive layer since more solids are present.
22. In reference to claims 98, which is drawn to the inclusion of two or more solvents, it is well settled that it is prima facie obvious to combine two ingredients, each of which is targeted by the prior art to be useful for the same purpose. *In re Linder* 457 F.2d 506, 509, 173 USPQ 356, 359 (CCPA 1972). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the invention to include two solvents in the adhesive taught by the combination of Saito and Noda.
23. In reference to claims 115-117, which claims that different substrate surfaces are coated with the adhesive composition, it is noted that the claims merely modify or change the order of process steps. Noda ‘990 exemplifies applying the adhesive between the two substrates (Example 19), wherein selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results. See MPEP § 2144.04. Since applicant has failed to show unexpected results for the claimed order of applying the adhesive, it is held that the selection of any order, including the claimed order, is prima facie obvious.



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24. In reference to claim 118, which claims a glass transition temperature of about  $-10^{\circ}\text{C}$ , it is noted that the term "about" permits some tolerance and Saito reference discloses that the PHA copolymer has a Tg of  $-7^{\circ}\text{C}$ . Wherein it is the examiner's position that one skilled in the art would have expected the composition of the Saito reference to have the same properties as the claimed composition. Additionally, a difference of  $1-3^{\circ}\text{C}$  in the glass transition temperature is not expected to change the properties of the composition. It has been held that a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

### ***Response to Arguments***

25. Applicant's arguments with respect to claims 81-122 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SAIRA HAIDER whose telephone number is (571)272-3553. The examiner can normally be reached on Monday-Friday from 10am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (571) 272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James J. Seidleck/  
Supervisory Patent Examiner, Art Unit 1796

Saira Haider  
Examiner  
Art Unit 1796

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